Trend Study 27R-10-98

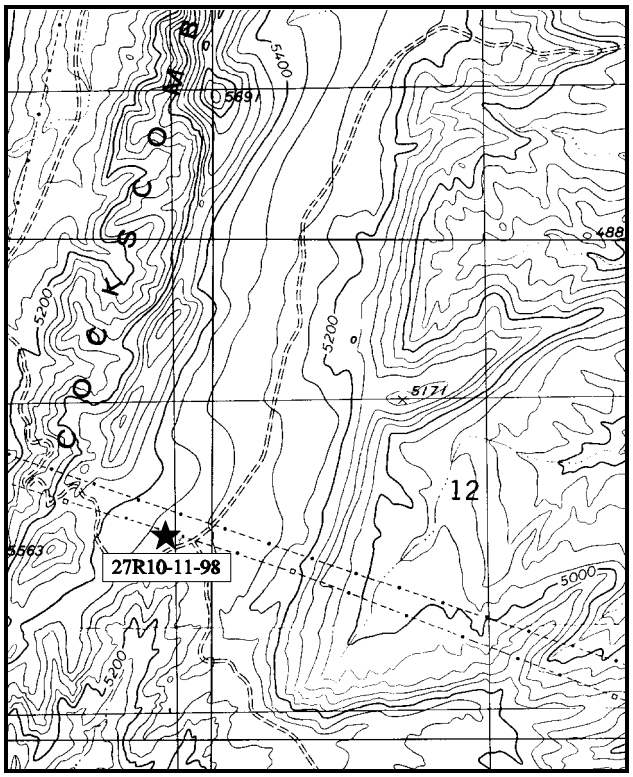
Study site name: Cockscomb Exclosure . Range type: Desert Brush .

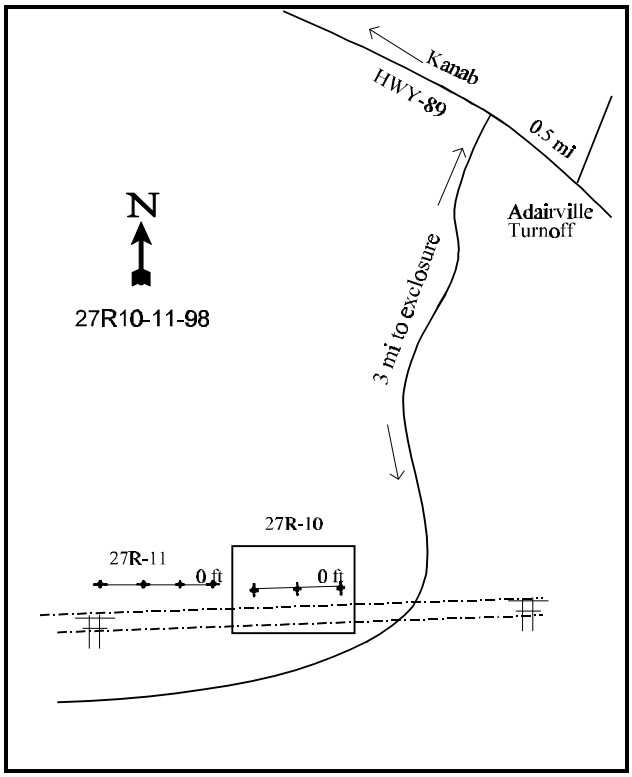
Compass bearing: frequency baseline 261°M degrees.

Footmark (first frame placement) 5 feet. Frequency belt placement; line 1 (11ft, 59 ft, & 95 ft), line 2 (34ft & 71 ft).

LOCATION DESCRIPTION

From HWY-89 and the Adairville turnoff (east of Kanab on south-89), go 0.5 miles west to a left turn. Turn left here and go 3 miles to an exclosure underneath the power lines. The 0 foot baseline stake is located inside the exclosure on the east side. The 0 foot stake has browse tag #110 attached and can be located by counting up 3 metal posts from the SE corner of the exclosure.





Map Name: West Clark Bench Diagrammatic Sketch

Township 43S , Range 2W , Section 11 UTM 4104556.219 N, 413032.337 E

DISCUSSION

Trend Study No. 27R-10

This is a new trend study placed inside the livestock exclosure. The Cockscomb Exclosure is located about 30 miles east of Kanab and about 7 miles north of the Arizona-Utah border. This is a two-way exclosure (livestock and outside) in the most northern part of a hot desert shrub community. The exclosure is at an elevation of approximately 5,360 feet. It has an east aspect with a slight slope (6-7%). Located beneath a high voltage power line, the exclosure has an area of almost one and a half acres (about 30,000 ft^2). A pellet group transect indicated use at 11 deer use days/acre and also a moderate density of rabbit pellet groups.

Soil textural analysis indicates it to be a sandy clay loam soil with a neutral pH (7.1). Average effective rooting depth (see methods) was estimated at 17 inches with an average soil temperature of 77°F at 17 inches. Both potassium and phosphorous measurements were low, 3.2 ppm and 3.3 ppm respectively. This may limit plant development where 10ppm for potassium and 70 ppm for phosphorous are thought to be the minimum. Rocks and pavement were encountered on the soil surface and provide nearly 5% combined cover. Although percent bare ground cover is high (45%), there is little erosion apparent at this time due to the soil texture and the lack of significant slope.

Browse species currently provide 57% of the vegetative cover. The most abundant species include: shinnery oak, yucca, broom snakeweed, and green ephedra. Shinnery oak has an estimated density of 3,120 stems/acre. Most of these plants were classified as mature (74%) and no seedling plants were encountered. Percent decadency is 8% and 75% of these plants were classified as dying. Average cover for shinnery oak is 6%. The dead to live ratio is 1:5. There is no apparent utilization and most plants exhibit good vigor. Yucca has an estimated density of 1,540 plants/acre. Ninety-four percent of the population were classified as mature and the remaining 4% classified as young.

Broom snakeweed has an estimated density of 1,260 plants/acre with an apparent stable population. A majority of the plants were classified as mature (79%) and no seedlings were sampled. Percent decadency is low and the dead to live ratio is currently 1:8, or about 11% are dead. Green ephedra has an estimated density of 1,020 plants/acre. No seedlings were encountered and 71% of the population were classified as mature. All of the decadent plants are also classified as dying. Many of the plants exhibited poor vigor in 1998 (71% of the population). One live and one dead juniper were located within the exclosure. Other browse species scattered throughout the area include: prickly pear cactus, low rabbitbrush, penstemon spp., Ribes spp., sand sagebrush, buckwheat, four wing saltbush, and antelope bitterbrush.

Grasses provide 34% of the total vegetative cover and 79% of the herbaceous understory cover. Cheatgrass provides the most cover and was found in 75% of the quadrats. Six weeks fescue is also present, but relatively less abundant. Needle and thread grass and sandhill muhly are the most abundant perennial species and when combined they account for 35% of the herbaceous understory cover. Other scattered grasses include: Indian ricegrass, sand dropseed, blue grama, bottlebrush squirreltail, and purple threeawn. Forbs are not nearly as abundant with fineleaf hymenopappus and Utah deervetch accounting for 88% of the forb cover.

1998 APPARENT TREND ASSESSMENT

There is currently no erosion apparent on the site, although some pedestaling was noted around some of the shrubs. The soil appears to become very compacted at a depth of about 16-18 inches. Although no seedlings were encountered for any of the browse species, the browse populations appear to be stable considering the harsh environment of the site. None of the browse species exhibited utilization at this time. The herbaceous understory is dominated by cheatgrass and six weeks fescue. Several perennial species are also present and appear to have good vigor.

HERBACEOUS TRENDS --
Herd unit 27R, Study no: 10

Type	Species	Nested Frequency '98	Quadrat Frequency '98	Average Cover % '98
G	Aristida purpurea	-	-	.00
G	Bouteloua gracilis	16	4	.60
G	Bromus tectorum (a)	276	75	2.73
G	Muhlenbergia pungens	37	12	1.58
G	Oryzopsis hymenoides	21	9	.19
G	Sitanion hystrix	2	1	.03
G	Sporobolus cryptandrus	12	7	.08
G	Stipa comata	31	15	1.49
G	Vulpia octoflora (a)	123	38	.31
Total for Annual Grasses		399	113	3.04
Total for Perennial Grasses		119	48	3.99
Total for Grasses		518	161	7.03
F	Androstephium breviflorum	4	2	.06
F	Arabis spp.	4	2	.01
F	Artemesia carruthii	3	2	.06
F	Hymenopappus filifolius	26	11	1.29
F	Lotus utahensis	12	6	.20
F	Machaeranthera canescens	8	4	.08
F	Oenothera pallida	21	8	.06
F	Sphaeralcea coccinea	9	4	.04
Total for Annual Forbs		0	0	0
Total for Perennial Forbs		87	39	1.82
Total for Forbs		87	39	1.82

BROWSE TRENDS --
Herd unit 27R, Study no: 10

Type	Species	Strip Frequency '98	Average Cover % '98
B	Artemisia filifolia	1	-
B	Atriplex canescens	0	1.48
B	Chrysothamnus viscidiflorus	2	.15
B	Ephedra viridis	13	1.61
B	Eriogonum spp.	1	-
B	Gutierrezia sarothrae	33	1.47
B	Opuntia spp.	7	.03
B	Penstemon spp.	2	.15
B	Pinus edulis	0	-
B	Purshia tridentata	0	-
B	Quercus havardii	27	5.97
B	Ribes spp.	2	-
B	Yucca spp.	20	.81
Total for Browse		108	11.68

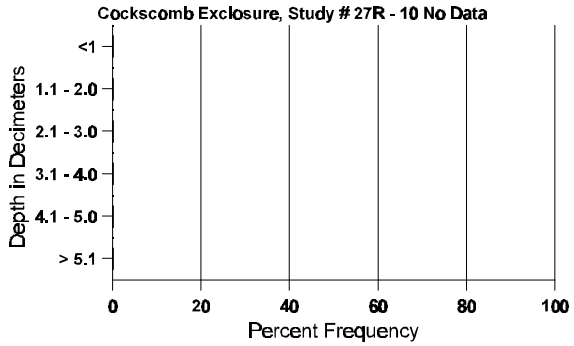
BASIC COVER --
Herd unit 27R, Study no: 10

Cover Type	Nested Frequency '98	Average Cover % '98
Vegetation	378	21.95
Rock	137	.72
Pavement	223	3.92
Litter	456	31.32
Cryptogams	46	1.33
Bare Ground	384	45.26

SOIL ANALYSIS DATA --
Herd Unit 27R, Study # 10, Study Name: Cockscomb Exclosure

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
17.3	77.0 (16.8)	7.1	60.2	18.0	21.8	.4	3.3	3.2	.4

Stoniness Index



PELLET GROUP FREQUENCY --
Herd unit 27R, Study no: 10

Type	Quadrat Frequency '98
Rabbit	13
Deer	3

BROWSE CHARACTERISTICS --
Herd unit 27R, Study no: 10

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia filifolia																		
M	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20	29	45	1
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing '98		Moderate Use 00%		Heavy Use 00%		Poor Vigor 00%									%Change			
Total Plants/Acre (excluding Dead & Seedlings)											'98				20	Dec:		-
Atriplex canescens																		
M	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	39	111	0
% Plants Showing '98		Moderate Use 00%		Heavy Use 00%		Poor Vigor 00%									%Change			
Total Plants/Acre (excluding Dead & Seedlings)											'98				0	Dec:		-
Chrysothamnus viscidiflorus																		
M	98	2	-	-	-	-	-	-	-	-	2	-	-	-	40	24	40	2
D	98	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
% Plants Showing '98		Moderate Use 00%		Heavy Use 00%		Poor Vigor 33%									%Change			
Total Plants/Acre (excluding Dead & Seedlings)											'98				60	Dec:		33%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ephedra viridis																		
Y	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	98	36	-	-	-	-	-	-	-	-	12	-	24	-	720	16	21	36
D	98	12	-	-	-	-	-	-	-	-	-	-	-	12	240			12
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
% Plants Showing '98				Moderate Use 00%			Heavy Use 00%				Poor Vigor 71%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'98		1020	Dec:		24%
Eriogonum spp.																		
M	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing '98				Moderate Use 00%			Heavy Use 00%				Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'98		20	Dec:		-
Gutierrezia sarothrae																		
Y	98	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
M	98	50	-	-	-	-	-	-	-	-	46	-	-	-	1000	10	16	50
D	98	2	-	-	-	-	-	-	-	-	-	-	-	2	40			2
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	180			9
% Plants Showing '98				Moderate Use 00%			Heavy Use 00%				Poor Vigor 03%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'98		1260	Dec:		3%
Opuntia spp.																		
M	98	7	-	-	-	-	-	-	-	-	7	-	-	-	140	7	16	7
% Plants Showing '98				Moderate Use 00%			Heavy Use 00%				Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'98		140	Dec:		-
Penstemon spp.																		
M	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60	16	22	3
% Plants Showing '98				Moderate Use 00%			Heavy Use 00%				Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'98		60	Dec:		-
Pinus edulis																		
M	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	8	21	0
% Plants Showing '98				Moderate Use 00%			Heavy Use 00%				Poor Vigor 00%					%Change		
Total Plants/Acre (excluding Dead & Seedlings)													'98		0	Dec:		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
M	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	16	23	0
% Plants Showing '98		Moderate Use 00%			Heavy Use 00%			Poor Vigor 00%							%Change			
Total Plants/Acre (excluding Dead & Seedlings)													'98		0	Dec:		-
Quercus havardii																		
Y	98	29	-	-	-	-	-	-	-	-	29	-	-	-	580			29
M	98	115	-	-	-	-	-	-	-	-	115	-	-	-	2300	44	37	115
D	98	12	-	-	-	-	-	-	-	-	3	-	-	9	240			12
X	98	3	-	-	-	-	-	-	-	-	3	-	-	-	820			41
% Plants Showing '98		Moderate Use 00%			Heavy Use 00%			Poor Vigor 06%							%Change			
Total Plants/Acre (excluding Dead & Seedlings)													'98		3120	Dec:		8%
Ribes spp.																		
Y	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20	8	11	1
% Plants Showing '98		Moderate Use 00%			Heavy Use 00%			Poor Vigor 00%							%Change			
Total Plants/Acre (excluding Dead & Seedlings)													'98		40	Dec:		-
Yucca spp.																		
Y	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	98	74	-	-	-	-	-	-	-	-	72	-	-	-	1480	21	28	74
% Plants Showing '98		Moderate Use 00%			Heavy Use 00%			Poor Vigor 00%							%Change			
Total Plants/Acre (excluding Dead & Seedlings)													'98		1540	Dec:		-